

## A STUDY OF TWINS

**Stocks, Percy, M.D., D.P.H.** *A Biometric Investigation of Twins and their Brothers and Sisters.* (*Annals of Eugenics*, Vol. IV, pp. 49-108, and Vol. V, pp. 1-55.)

TWINS are of two kinds: they either bear no more resemblance to each other than do ordinary brothers and sisters, in which case they are called fraternal, or they tend to be extraordinarily alike. Such supplied the inspiration of the author of the old song:

“And so throughout our life the same  
Absurd mistakes went on,  
And when I died, the neighbours cried,  
And buried brother John.”

These are supposed to have arisen from the same ovum and spermatozoon and are called “identical” or monozygotic, as distinct from the dizygotic fraternal twins.

In his *Inquiries into Human Faculty*, Francis Galton instanced some pairs of “identical” twins as the supreme triumph of Nature over Nurture. Not only were the twins which he described practically indistinguishable, but some pairs were subject to the same unusual diseases simultaneously, and one pair committed suicide separately, and unknown to each other, within a few hours at practically the same spot. We seem to see the iron finger of predestination tracing our fate at birth.

Since then there have been quite a number of investigations into the various phenomena of twinning, particular attention being paid to “identical” twins. These are invariably of the same sex, but twins of the same sex are not invariably “identical” and Fisher was the first to point out that the proportion of “identical” twins could be calculated (a) on the hypothesis that as many pairs of “fraternal” twins might be expected of the same sex as of opposite sexes and (b) in the case of a particular population of twins arbitrarily selected, measurements of a character normally distributed enable us to calculate the numbers of “identical” and “fraternal” like-sexed twins by dividing

the distribution of the differences between the twins into two normal distributions, one of which has the same variance as that found in corresponding twins of opposite sex when correction has been made for sex.

There still remained the question of which particular twins were to be regarded as “identical,” and until recently no very satisfactory criterion has been forthcoming, though Siemens, Weinberg, Komai and others have amongst them laid the foundation of the tests which are required.

It is the merit of the present work that a method combining finger-prints with other measurements has been worked out and tested on comparatively large numbers of twins (108 pairs of like-sexed twins were examined), whereby the error in diagnosing “identical” or “fraternal” like-sexed twins is apparently reduced to quite a small percentage.

Separated by this method the distribution of numbers of pairs of corresponding fingers showing “similar” patterns in a pair of twins were found to be as follows:

Nos. of similar pairs	0	1	2	3	4	5	6	7	8	9	10	Tot.
Unlike Sex ...	...	3	10	9	9	9	3*	-	-	-	-	52
Like Sex :												
Fraternal	...	3	8	11	15	11	4	-	-	-	-	52
Identical...	...	-	-	-	-	21	15	12	7	1		56

This separation gives good fits when tested against the distribution of differences in height calculated by Fisher's method.

Nevertheless, I am not clear that the possibility of “identical” twins having less “similar” pairs of fingers than six has been sufficiently tested: after all, Fisher's method has an error of random sampling like everything else, and the distribution 21, 15, 12, 7, 1, does rather ask for another tail, “small but adequate,” like that worn by Pe Lung.

Besides separating the identical twins, Dr. Stocks has made a considerable number of physical measurements on the various kinds of twins and some of their brothers and sisters, has calculated mean differences, standard deviations, correlation coefficients,

\* Two of these would have been considered “identical” if of like sex.

and so forth, and has elicited various interesting and important facts.

Of these I may mention that in this sample of children "The degree of resemblance in dizygotic twins of like or opposite sex is not appreciably different from that met with in all pairs of children born to the same parents at different times, regardless of the intervals between the births." Which confirms the popular belief.

Also "Monozygotic twins tend to be taller and heavier, during childhood at least, than dizygotic twins of the same ages," and I may add they appeared to be superior in other characters, even to their other brothers and sisters. This seems to raise the question whether the superiority was due to the twinning or vice versa.

Dr. Stocks has also investigated the intelligence of the children both by testing the "I.Q." and by taking the teachers'

opinions, and he makes the interesting observation that the I.Q. cannot be supposed to measure merely the innate abilities of the child: it is certainly affected by the general intellectual status of the family. In particular the child is influenced by his elder siblings and by his twin, if any.

This makes it extraordinarily difficult to differentiate between Nature and Nurture; "identical" twins are not only "identical" by nature but in most cases practically so by nurture, and are thus the most economical material for testing experimental diets and so forth.

The printing is wonderful, as is usual with the Cambridge Press, but I fancy that I have discovered one mistake: No. 28 pair of like-sexed twins are D by the B5 test, not M as in the last Table.

A very thorough piece of work.

"STUDENT."

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